THE WILDLIFE SOCIETY MEMBERSHIP SURVEY

FINAL REPORT

by

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EXECUTIVE SUMMARY

This study sought to learn more about the TWS membership, including the wildlife-related issues that are of highest priority and the types of wildlife paradigms held by the membership. Along with this information, the study provided a comprehensive evaluation of the wide array of services offered by TWS, and sought input into changes sought by the membership.

Most TWS members are male, 30 to 49 years of age, and have been members for at least 10 years. The majority indicated that they subscribe to and read the 3 major publications of the Society. Roughly half of the membership has been active in TWS activities of some type. Most members belong to at least one conservation organization, and just over half belong to other scientific and professional natural resource societies.

Among the many issues TWS might work with, members gave the highest priority to threatened and endangered communities/habitats and species management, wetlands/riparian management, and biological diversity conservation. At the other end of the spectrum, animal rights and subsistence hunting issues were given relatively low priority ratings.

An attitude scale was used to characterize the wildlife paradigm of TWS members. Three factors, wildlife use, wildlife pain and suffering, and ecological systems explained 53.6% of the model variance. A cluster analysis performed on the mean scores of these 3 variables showed that TWS members are remarkably similar with respect to these factors. The vast majority of members had moderately to strongly positive utilitarian attitudes toward wildlife, were moderately concerned about the pain and suffering of individual animals, and had moderate to strong feelings that management and resource emphases should be placed at the system level on wildlife populations and habitats rather than on the well-being of individual animals.

Most respondents were also in agreement about the role of the wildlife manager in dealing with the public and arriving at public policy decisions. Managers should obtain public input and factor that into the decision-making process, and then proceed to do the planning and make the final decision, according to 73.1% of respondents.

Generally high evaluative marks were given to the Society's 3 primary journal publications. Slightly over half would favor hiring a paid managing editor to handle the large volume of manuscripts submitted to these journals. Moderately important to very important ratings were also given to all TWS books and special publications that we inquired about, and to the wide

variety of meetings that TWS sponsors at various levels from state meetings to international symposia.

The one area investigated for which responses were relatively critical involved the TWS certification program. Only 37.6% of respondents felt that the program is serving a useful role in advancing the professional standing of wildlife biologists to the public. Only half of the respondents felt that the objectives of the certification program have been made clear to members. About half felt that the program should be revised to reflect the various specialty areas within the profession, especially wildlife manager, and possibly wildlife conservation officers, information and education specialists, and wildlife planners. Related to this, one possible new direction supported by a majority of respondents was for TWS to establish and hold members accountable to a set of professional standards. A majority of respondents also felt that TWS should encourage accreditation of college and university wildlife education programs.

The professional development program received generally high ratings from those who are familiar with it, but the majority of members are not familiar with the program. In terms of additional education needs, most respondents felt that people newly entering the profession are still in need of additional skills or expertise. Communications skills and public relations were indicated most frequently. These same topics along with additional computer skills were most frequently mentioned as continuing education needs for the profession generally.

This study has produced an insight into the characteristics, concerns, attitudes and beliefs of TWS members along with a comprehensive evaluation of TWS services and programs. We believe the results of the study will be useful in guiding TWS priorities for the next several years. Such study results become dated, however, as new information is produced and new issues surface. We suggest that the TWS officers be alert to this and consider repeating the study at a 5 to 10 year interval, as needed.

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INTRODUCTION

The Wildlife Society (TWS) is the primary professional society for the wildlife profession, and also serves as an important focus of activity for many natural resources and environmental professionals whose subject matter extends beyond wildlife. As of late 1991, TWS had 8,881 members.

For many years the diversity of TWS membership has been apparent. Members include field biologists, research biologists, managers, state and federal wildlife agency administrators, college and university teachers and researchers, and others. The orientation of the membership is also broad. Primary interests of members include game species, nongame species, habitat management, human dimensions, wildlife and broader environmental education, and others. A large portion of the membership is primarily management oriented, while many others have research as their primary orientation.

The large and diverse membership of TWS offers both opportunities and challenges to its officers and committees. To meet these opportunities and challenges, TWS attempts to give priorities to emerging areas that the officers feel are important to the wildlife profession and to provide a range of basic services that are important to large segments of the membership. Periodically it is important for any professional organization to evaluate its efforts and assess future directions. While such evaluations and assessments occur almost continuously within TWS at a level of seeking input from committees and especially knowledgeable members regarding particular topics, TWS had not previously conducted a comprehensive evaluation of its activities that can be effectively accomplished only through a membership survey.

In response to the sense of TWS officers that a comprehensive evaluation of the Society's programs and services was in order, and reflecting their desire to better understand the interests and professional orientation of the membership, TWS and the Human Dimensions Research Unit (HDRU) at Cornell University collaborated to design and conduct a membership survey. This document presents the results of that survey.

METHODS

Available funding for the study permitted a survey of a sample of 1,000 TWS members from throughout the U.S. and Canada. A computer tape of the mailing addresses and records of TWS members was sent to Cornell's HDRU. Cornell researchers divided the membership into 2 large strata, an eastern stratum (Northeast, Southeast, and North Central TWS sections) and a western stratum (Central Mountains and Plains, Southwest, Northwest, and Western TWS sections), and drew random samples of 500 members from each.

The HDRU took the leadership in designing the questionnaire for the study based upon a list of information desired by TWS officers. The officers and the HDRU researchers interacted closely on successive drafts of a questionnaire until an acceptable version was produced. The final questionnaire was a 10-page, 8.5" by 11" instrument.

The original survey mailing and up to 3 reminder letters were implemented between 6 September and 7 October 1991. Canadian mailings were delayed by one week due to a brief postal strike. The timing and content of each mailing followed procedures used historically by the HDRU to maximize response rates (Brown et al. 1989) and is very similar to Dillman's Total Design Method (Dillman 1978).

Because TWS had not previously conducted a membership survey and the officers wanted to allow maximum opportunity for input from the membership, an unusually large number of open-ended questions were used in the questionnaire. An "open-ended" question is one for which no response categories are listed. An example of such a question used in this survey was:

> "Please indicate below any changes you would like to see made in the *JWM, (Journal of Wildlife Management), WSB (Wildlife Society Bulletin), or WM (Wildlife Monographs). (Be sure to specify which publication(s))*."

The answers to such questions must be interpreted very carefully. It is rare in open-ended questions that a majority of respondents would make any 1 suggestion or comment. As a result, it is possible that the suggestion made most frequently to the above question would be one that the majority of the membership would not favor. On the other hand, the fact that 20% gave a particular suggestion does not mean that only 20% would favor that suggestion, for many respondents simply did not think of it.

The primary proper use of open-ended questions is to obtain ideas for further consideration. The number of respondents who make a particular suggestion is a good index

of the visibility of that suggestion in the population surveyed, but it is not necessarily a good index of the popularity or acceptance. Because of the different way in which answers to open-ended questions should be interpreted, all subject matter that used open-ended questions will be noted in the "Results" portion that follows.

A variety of question types were used in the survey to obtain a membership profile and evaluation of TWS services. Major sections included in the survey were assessment of TWS publications and other services, priority issues, attitudes and beliefs about current wildlife topics, and other input from respondents.

RESULTS

In each of the 2 strata, 499 of the sample of 500 questionnaires were deliverable. An overall response rate of 80.7% of delivered questionnaires was achieved (83.4% for the East stratum and 78.0% of the West stratum). The high response rate is indicative of the response rates of professionally designed and administered surveys to specific groups who have strong interest in the subject matter of the survey. The response rate also speaks well for the strong interest of the membership in their professional wildlife association.

A telephone follow-up survey of a subsample of nonrespondents was not deemed necessary because of the high response rate. Computer-weighted responses to the survey to appropriately take into account slight differences in the overall magnitude of the 2 strata should very nearly reflect the opinions and reactions of the entire TWS membership.

Membership Profile

The vast majority of respondents (81.4%) were male. They ranged in age from 19 to 86; the mean age was 40.9, and the median was 39.0. Almost two-thirds were between the ages of 30 and 50; 17% were younger than 30, while 20% were older than 50 (Table 1).

Respondents have been TWS members for a mean of 13.9 and a median of 11.0 years. Assuming that for the vast majority of respondents these are consecutive and uninterrupted years, roughly 6% of the membership would have been newly added during each of the past 3 years. Just over half (51.6%) of respondents indicated that they have been involved at some time in TWS activities that involved being an officer, doing committee work, or holding a volunteer position. This would include state and chapter-level activities.

Table 1. Age distribution of TWS respondents.

Age Category	Pct
<30	17.3
30 - 39	33.9
40 - 49	28.9
50 - 59	10.3
60 - 64	3.7
>64	5.9

Just over half (55.2%) of respondents indicated that they belong to other scientific and professional natural resource societies, and 76.3% indicated that they also belong to conservation organizations. Respondents collectively belonged to a total of 152 professional societies and 136 conservation organizations. However, very few of these societies and organizations captured large portions of the TWS membership. Scientific and professional societies to which more than 5% of respondents indicated membership included the American Society of Mammologists (8.7%), Society of Conservation Biologists (8.7%), American Ornithological Union (8.3%), American Fisheries Society (7.0%), Society of Range Management (6.0%), and Ecological Society of America (5.4%). Conservation organizations to which more than 5% of respondents held membership were the National Wildlife Federation (30.2%), Audubon (22.5%), Nature Conservancy (21.2%), Ducks Unlimited (13.2%), World Wildlife Fund (7.0%), state and provincial conservation federations (5.8%), and the Sierra Club (5.6%). Notably small minorities indicated membership in several very visible national organizations: National Rifle Association (3.0%), Greenpeace (1.6%), and Defenders of Wildlife (1.5%). It is possible that additional respondents were members of NRA but did not think to list it as a "conservation organization."

Assessment of TWS Publications and Other Services

Periodicals

The majority of responding members indicated that they both subscribe to and read the Society's 3 primary journal publications (Table 2). Over 17% had submitted a manuscript for

publication to the Journal of Wildlife Management (JWM) sometime in the past, nearly 12% within the past 5 years.

Table 2. Percent of respondents who currently subscribe to, typically read, or have submitted a manuscript to Society journals within the past 5 years.

TWS Publication	Subscribe	Read	Submitted Manuscript
Wildlife Society Bulletin	73.4	81.2	11.9
Journal of Wildlife Management	60.6	76.7	17.4
Wildlife Monographs	57.8	63.6	1.6

Respondents generally gave the 3 primary TWS publications high marks with regard to importance of the content to the profession, range of contemporary concerns addressed, and the quality of articles (Table 3). The importance of the content of these 3 publications was rated as moderately important to very important by at least 90% of respondents. While the majority of respondents agreed that the range of material covered by each publication was "about right," 33% indicated that the range of concerns addressed by JWM is too narrow. The modal response for the quality of all 3 publications was "very good."

It was noted in the questionnaire that TWS staff try to make a distinction between the content of WSB and JWM, which is often a difficult and controversial process. Over 79% of respondents indicated that they were satisfied with the distinction being made in the content of the 2 publications. Of the one-fifth who indicated dissatisfaction, 53.1% were not certain that they could identify the distinguishing factors between the 2 publications. Another 10.1% of those expressing dissatisfaction indicated that the WSB still has technical or research articles, as does the JWM.

Suggestions for improvement of each of these 3 publications were sought in the format of open-ended questions. These are summarized below:

WSB. 28.9% of respondents offered a wide variety of suggestions. The most frequent suggestion (23.6% of those seeking changes; 6.8% of all respondents) was for more management articles. The only other suggestion made by more than just a few

Table 3. Summary evaluation of respondents of the Wildlife Society Bulletin (WSB), Journal of Wildlife Management (JWM), and Wildlife Monographs (WM), in percents.

IMPORTANCE OF CONTENT TO THE PROFESSION

Publication	Not Important	Slightly Important	Moderately Important	Very Important
WSB	1.0	8.9	40.1	50.0
JWM	0.9	7.5	32.8	58.8
WM	1.5	14.3	37.0	47.1

RANGE OF CONTEMPORARY WILDLIFE MANAGEMENT CONCERNS ADDRESSED

	Too Narrow	About Right	Too Broad
WSB	15.9	82.1	2.0
JWM	33.4	62.5	4.1
WM	26.6	72.1	1.3

QUALITY OF ARTICLES

	Poor	Fair	Good	Very Good	Excellent
WSB	0.5	8.0	38.0	41.1	12.3
JWM	0.4	6.4	27.6	45.7	19.9
WM	0.3	4.4	27.4	45.8	22.0

respondents was for more coverage of conservation issues that are broader than single species or wildlife issues (11.6% of those seeking changes; 3.4% of all respondents). Topics such as old growth, mitigation, and restoration were given as illustrations.

JWM. 31.6% of respondents provided a range of suggestions for JWM. The most frequent suggestions made were the same as for WSB. More management articles were requested by 22.4% of those seeking changes (7.1% of all respondents). Coverage of broader conservation issues was suggested by 9.0% of those seeking changes (2.9% of all respondents). Approximately the same number (this required combining individual

categories) in essence suggested more nongame articles ("fewer deer, waterfowl articles"; "more nongame articles").

WM. Only 12.0% had suggestions for improving WM. The most frequent suggestion again was for more management coverage (21.6% of those seeking changes; 2.6% of all respondents). A smaller number (15.5% of those seeking changes; 1.9% of all respondents) wanted more ecosystem rather than game-focused manuscripts.

The difficulty of handling the volume of manuscripts and related communications for these publications was noted in the questionnaire. A slight majority of respondents (56.6%) indicated that they would favor hiring a paid managing editor for TWS publications to overcome this problem. Only 15.1% were opposed to this, while 28.3% were unsure. Those who were not opposed to hiring a paid managing editor responded with similar approval frequency to 3 different ways of funding such a position: an increase in library and nonmember subscription costs (53.4%), an increase in member subscription costs (52.5%), and an increase in page costs to authors (52.0%) (respondents could check more than one funding option). Fewer (36.7%) indicated that the cost should be recouped through a general dues increase. Very few other suggestions were given.

Books and Special Publications

The principal books and special publications of TWS generally received moderately high evaluations from the membership in terms of level of importance to the profession (Table 4). The *Wildlife Management Techniques Manual* was both the most familiar publication (fewest "Don't Know" answers) and the highest rated. This was followed by *Wildlife Conservation Principles and Practices, Conservation Policies of The Wildlife Society*, the *Technical Review Series, Wildlife Ecology and Management: Selected Readings*, and *Readings in Wildlife Conservation*, all of which received mean ratings of at least 3.00 (moderately important). However, 41.2% were not familiar with the *Technical Review Series*. The *Checklist of North American Plants* received the lowest rating of 2.66, somewhat above the midpoint between slightly and moderately important. It should be noted that some of these publications are more targeted toward specific segments of TWS than others. Thus, an importance rating across the general membership may give an inaccurate portrayal of the importance of the publication for the segment it was designed for.

Table 4. Importance of the content of TWS books and special publications to the profession, as rated by respondents.

Publication	Importance (Category Code for Calculation of Mean Importance Score) Not Important (1)	Slightly Important (2)	Moderately Important (3)	Very Important (4)	Don't Know	Mean Score
	Percent					
Techniques Manual	1.0	6.9	23.9	64.6	3.5	3.57
Wildlife Conservation Principles and Practices	1.3	9.6	29.9	42.0	17.3	3.36
Conservation Policies of The Wildlife Society	1.9	13.1	29.1	37.9	18.0	3.26
Technical Review Series	0.8	9.9	28.4	19.7	41.2	3.14
Wildlife Ecology and Management: Selected Readings	2.0	14.6	42.1	25.1	16.2	3.08
Readings in Wildlife Conservation	2.7	17.5	41.0	23.6	15.3	3.01
Checklist of North American Plants	7.6	22.9	34.2	18.2	17.3	2.66

Just over half (53.3%) of respondents collectively provided 144 suggestions to an open-ended question requesting suggestions for new publication topics that they believe are not now adequately covered. Where possible, these topics have been grouped in Table 5 to suggest broader areas of concern where large portions of the more discrete topics could conceivably be covered in one publication. This is not intended to detract from the consideration of a publication on any of the more discrete topics. The 3 leading areas identified were conservation and habitat protection of diverse species, human dimensions and public policy, and upland terrestrial ecology and wildlife management.

Table 5. Subject area suggestions for future TWS publications, arranged by topic areas, and the percent of the 53.3% of respondents making suggestions who listed each subject area.

	Percent
TOPIC AREA I. Conservation and Habitat Protection of Diverse Species	
Conservation biology/biodiversity	12.8
Nongame wildlife	7.9
Habitat management/restoration	7.7
Threatened and endangered species recovery (e.g., methods and impacts on private landowners)	6.8
Wetlands habitat management and values	5.1
Management of fragmented ecosystems (e.g., corridors)	2.6
Habitat evaluation procedures by species, especially nongame	2.1
TOPIC AREA II. Human Dimensions and Public Policy	
Integrating human dimensions into management programs	5.1
Public policy	3.9
Animal rights, animal welfare	2.8
Public relations	2.1
TOPIC AREA III. Upland Terrestrial Ecology and Wildlife Management	
Ecosystem management	3.7
Upland game ecology and management	3.7
Forest wildlife management	3.5
Big game ecology and management	3.0
OTHER TOPICS.	
Wildlife law enforcement (e.g.,forensics, variations in methods/techniques across states and provinces	3.2
Publications for the general public	2.1

Meetings

TWS has traditionally sponsored a variety of scientific and technical meetings and conferences, ranging in scope from state and provincial chapter meetings to national/international conferences and symposia. On average, all of these meeting types were evaluated by respondents to be in the "moderately important" range (Table 6). TWS section meetings/conferences were rated slightly lower in importance than other types of meetings.

Table 6. Importance of TWS-sponsored scientific/technical meetings and conferences, as rated by respondents.

Type of Meeting	Importance (Category Code for Calculation of Mean Importance Score)				
	Not Important (1)	Slightly Important (2)	Moderately Important (3)	Very Important (4)	Mean Score
	Percent				
State/provincial chapter meetings and field trips	3.8	16.4	34.5	45.3	3.21
TWS section meetings/ conferences	5.3	22.1	43.0	29.6	2.97
Regional conferences/symposia/ workshops	2.3	11.2	43.2	43.3	3.23
Technical/specialized group meetings	1.8	10.9	44.7	42.6	3.28
National/international conferences/symposia	3.3	19.5	35.2	42.0	3.16

A longstanding concern of TWS officers has been to have the North American Wildlife and Natural Resources Conference be as meaningful as possible to TWS. In an attempt to have the North American serve as a technical conference as well as a policy-oriented conference, TWS has sponsored 2 technical sessions at recent North American conferences. Most responses to an evaluation of this practice suggest that an additional technical conference is not needed:

- 39.7% indicated the North American as currently structured meets their needs.
- 35.5% indicated state/provincial and regional meetings meet their needs.
- 8.8% indicated the North American, as primarily a policy conference, meets their needs.
- 16.0% indicated their needs would be better met by an additional TWS technical conference.

Of this latter 16%, about half (50.5%) indicated that the goal of an additional technical conference should be to share and discuss research results and how they can be incorporated into management. The only other notable grouping (9.3% of those who wanted a new conference) wanted presentations of case studies of real-world management problems.

Certification

Because of the time and resources TWS spends on its certification program, several aspects were evaluated in this survey. The results suggest that an even closer examination of TWS certification activities may be warranted.

Only 37.6% of respondents indicated they believe that the TWS certification program "is serving a useful role in advancing the professional standing of wildlife biologists to the public." Almost as great a number (30.0%) replied negatively to the above statement, and another 32.4% indicated they were unsure. About half (50.2%) believe that the objectives of the certification program have been made clear to the membership; 29.2% responded negatively and 20.7% were unsure.

Because of the breadth of expertise needed in contemporary wildlife management, members were asked whether the certification program should be refined to provide different criteria and recognition for different types of specialties within the profession. About half (50.6%) responded positively, 27.3% responded negatively, and 22.1% were unsure. Of the half who responded positively, the desire for TWS to consider development of certification requirements for other specializations was expressed most frequently for the position of wildlife manager (by 81.6% of those desiring expanded certification). Analogous proportions favoring certification for other positions were 63.3% for wildlife conservation officers, 60.9% for information and education specialist, 54.4% for wildlife administrators, 50.4% for wildlife planners, and 31.4% for human dimensions specialists.

Slightly over one-quarter (26.5%) of those favoring expanded certification wrote in other specialties that should be considered for development of certification requirements. The leading suggestion (by 26.4% of those with write-in suggestions) was to separate out managers and researchers. The only other suggestion made by more than 10 individuals (11.4% of those with write-in suggestions) was to establish habitat-specific certification (e.g., forest, rangeland, or wetland biologist or specialist).

Professional Development

TWS has a relatively new voluntary professional development program. The officers sought input from the membership on the appropriateness of the level of effort currently expended on the program. The results indicate that the level of awareness of the membership of the program is very low. Most respondents (61.6%) did not know enough about the program to have an opinion of it. The majority of those who considered themselves sufficiently knowledgeable to evaluate the program checked one of the positive categories: 50.3% indicated the program dealt with the need for professional development at about the right level of intensity, and 32.0% indicated it should be expanded and eventually made mandatory for certification status. The remainder (17.7% of those with an opinion) indicated that professional development should not be a high priority for TWS and that less effort should be placed on it.

Priorities on Issues

To gain a better understanding of which natural resource issues the membership believes TWS should be giving the highest priority, 22 issue areas were rated from high (1) to low (5) priority by respondents. Topics dealing with threatened and endangered species and habitats, wetlands/riparian management, and biodiversity conservation received the highest priority rankings (Table 7), which were in the high to medium high range (mean of < 2.00). Nine other topics fell within the medium high to medium priority range (mean ratings of 2.00 to 2.50). These topics received very similar ratings from the East and West strata of respondents. Although a number of topics have mean scores whose differences are statistically significant (due in part to large sample sizes), the only issue to receive a meaningful difference in priority rating between the 2 strata was livestock grazing on public lands, rated higher by western members.

Table 7. Priority members believe TWS should give to 22 natural resources issue areas, from highest to lowest priority.

Issue Area	Mean Priority (1 = High; 5 = Low)		
	Weighted Totals	East Stratum	West Stratum
Threatened and endangered communities/habitats	1.44	1.47	1.41
Threatened and endangered species management	1.66	1.64	1.67
Wetlands riparian management	1.76	1.81	1.70
Biological diversity conservation	1.82	1.90[1]	1.74[1]
Old growth forest management	2.11	2.17[1]	2.06[1]
Chemicals/pesticides and other environmental contamination	2.18	2.20	2.17
Oil development of Arctic National Wildlife Refuge	2.30	2.33	2.27
Timber harvest on public lands	2.22	2.34[1]	2.10[1]
Livestock grazing on public lands	2.31	2.53[1]	2.08[1]
Waterfowl management	2.35	2.32	2.38
Urban and nongame wildlife	2.41	2.41	2.41
Agricultural land management	2.44	2.47	2.40
Human dimensions of wildlife management	2.45	2.40	2.51
International wildlife conservation	2.59	2.63	2.54
Wilderness management	2.60	2.59	2.61
Federal wildlife agency budgets	2.63	2.65	2.61
Trapping/hunting rights	2.67	2.59[1]	2.76[1]
Animal welfare	2.82	2.77	2.87
Wildlife damage/nuisance management	2.83	2.70[1]	2.96[1]
Urban wildlife	2.95	2.92	2.99
Animal rights	3.10	3.02[1]	3.18[1]
Subsistence hunting	3.47	3.55[1]	3.39[1]

[1]Differences between mean scores of East versus West stratum are statistically significant at $p < 0.05$ (t test, difference between the means).

As to the role TWS should play in addressing issues that are of high priority, most respondents (70.7%) indicated that TWS should use multiple approaches: (1) provide scientific/management information, (2) lobby policymakers, and (3) engage in public education campaigns to inform citizens about TWS positions on issues. Similar proportions felt that the TWS role should be limited to approaches (1) and (2) only (15.7%), and (1) only (13.6%).

Attitudes and Beliefs about Current Wildlife Management Topics

In recent years wider segments of the public, many with diverse views, have become increasingly involved in wildlife issues. The ethics and morality of hunting and trapping, concerns about the well-being of individual animals and not just the viability of wildlife populations, and topics related to threatened and endangered wildlife and biodiversity have gained increased visibility through the efforts of a wide range of organizations.

For purposes of understanding and communicating with the various segments of the public, it is important to know how particular segments view wildlife and wildlife issues. Work on classifying the orientations of Americans toward animals wildlife was initiated by Kellert and Berry (1980). Although extremely valuable, the breadth of topics (e.g., pets, domesticated animals, wildlife) they examined was somewhat broader than what is often directly useful to the wildlife community. Subsequent work by the Human Dimensions Research Unit (HDRU) at Cornell has suggested that no one attitude scale likely will encompass the range and depth of wildlife topics that would be central to any issues context. A previous wildlife attitudes and values scale (WAVS) (Purdy and Decker 1989) developed at Cornell proved particularly useful in regard to certain landowner and recreationist topics (i.e., traditional-conservation, societal-benefits, and problem-acceptance attitudes), but less useful in some other contexts that have gained increasing importance in recent years.

Recently HDRU staff began working on a new scale that obtained measures of people's wildlife-related paradigms with particular regard to some wildlife issues that are most visible today. These include attitudes toward hunting and trapping, degree of concern about pain and suffering by wildlife resulting from human uses, and degree of interest and concern about individual (wildlife) animals versus the health and viability of populations. This scale has been used in a concurrent study of wildlife rehabilitators in New York (Siemer and Brown 1992; Siemer et al. 1992), and we felt it would be valuable to gain a sense of professional orientations toward these topics. Thus, the scale was used as part of the TWS survey.

Each attitude statement included in the scale was presented in a typical Likert format with strongly agree, agree, neutral (neither agree nor disagree), disagree, and strongly disagree response options. Some statements were intentionally worded negatively or in such a way that the majority would likely disagree with them; this is standard practice in attitude survey research to ascertain whether respondents are reading and considering each statement with reasonable care. The results of the individual items are reported in Appendix A by subject area.

We should note that although the distribution of responses to a particular attitude item may be of interest, any single item is too brief in its description and therefore too dependent on the specific wording used to elicit a definitive position beyond general agreement or disagreement from respondents. For this reason, we ascribe less importance to the response on any one item and more importance to the patterns with which groups of items are answered.

A scale of 18 items was used to characterize the wildlife paradigm of TWS members. Several measures were used to determine the reliability and internal consistency of the scale items and to ascertain tradeoffs between additional scale reliability and loss of information by discarding various items. The decision was made that for further analysis, 14 of the 18 items would be retained. This 14-item scale had a Cronbach's alpha score of 0.7856, and a scale reliability score r_{KK} (Nunnally 1978) of 0.8177. The standard deviation of inter-item correlations, r_{ij} was 0.0689. Each of these scores is well within accepted levels of scale reliability.

The 14-item scale was then subjected to factor analysis with varimax rotation, using the principal components extraction. Three factors emerged which explained 53.6% of the model variance. These were named wildlife use (Factor I), wildlife pain and suffering (Factor 2), and (3) ecological systems (Factor 3). The wildlife use factor dealt with such topics as hunting, trapping, use of wildlife for food, and human domination over wildlife. The pain and suffering factor dealt with the extent to which pain and suffering of individual wild animals should be made an active concern in the conduct and management of wildlife activities and programs. The ecological systems factor dealt with the emphasis that should be placed on wildlife populations and their habitats versus concerns for individual animals.

The mean scores for these three factors were then converted into variables, and a cluster analysis was performed to determine the magnitude and major groupings of various TWS wildlife paradigms. An overall examination of the cluster analysis showed that TWS members are remarkably similar with respect to a wildlife paradigm that encompasses these 3 factors. As an example, if the 775 individuals who answered all of the attitude items were forced into 6 clusters or groupings, 646 (83.4%) would fall into a single cluster. We therefore decided to choose a

model with more than 6 clusters so that we could examine at least 2 or 3 groups with a meaningful number of members (even if the groups were somewhat similar). This led to our choice of an 8-cluster model (Table 8). Four of these clusters have 4 or fewer individuals and can be considered as rare or outliers with respect to TWS members.

Type 1, which encompassed 53.4% of respondents, had strong utilitarian attitudes toward wildlife. They were strong proponents of hunting, yet were moderately concerned about the pain and suffering of individual animals. They felt strongly that the management and resource emphases should be placed at the system level, on wildlife populations and habitats, rather than on the well-being of individual animals.

Type 2, which included 29.8% of respondents, had moderately positive scores on each of the 3 scale factors. They were moderately utilitarian toward wildlife, were moderate proponents of hunting, had moderate beliefs that pain and suffering of individual animals should be of concern to recreationists and to management, and had moderately positive beliefs that populations and habitats should take priority over the management and concern about individual animals.

Type 3, which included 10.2% of respondents, were moderately utilitarian toward wildlife, although they were strong proponents of hunting. These respondents were neutral on the other 2 factors of pain and suffering and about ecological systems.

Type 4, included 5.0% of respondents. This group was moderately utilitarian and strongly supported hunting; its Factor 1 mean score was similar to that of Type 1. Type 4 differed from those of all other types in that their mean score on Factor 2 (pain and suffering) was negative, which indicated that they felt that pain and suffering of individual animals should not be an important concern. Perhaps consistent with this, Type 4 respondents had the highest mean Factor 3 scores, which indicated that they felt strongest that population and habitat concerns were far more important than concerns about individual animals.

Although we will not describe the other 4 clusters in any detail because of their low numbers, we have retained them in Table 8 because it is possible that these groupings exist in much larger numbers in the general population or in particular wildlife interest groups. We will note that only Type 5 (3 respondents; 0.4%) were negative with respect to wildlife use values and hunting; Type 8 (4 respondents; 0.5%) were neutral in these respects.

The results of these attitude and belief measures suggest that TWS members are remarkably uniform in their overall perspective on the role of wildlife management, the acceptability of various wildlife uses, and concerns dealing with individual animals. It should come as no surprise that the vast majority of respondents approve both of actively managing

Table 8. Cluster groupings of TWS members with regard to Wildlife Use and Management paradigm. Eight-cluster model.

Cluster No.	1	2	3	4	5	6	7	8
N	414	231	79	39	3	4	1	4
%	53.4	29.8	10.2	5.0	0.04	0.5	0.01	0.05
Wildlife Use (Factor I)	Strongly positive $\bar{x}$=1.59[1]	Moderately positive $\bar{x}$=0.67	Moderately positive $\bar{x}$=1.26	Moderately positive $\bar{x}$=1.34	Moderately negative $\bar{x}$= -0.93	Moderately positive $\bar{x}$= 0.72	Moderately positive $\bar{x}$=1.20	Neutral $\bar{x}$=-0.15
Pain and Suffering (Factor II)	Moderately positive $\bar{x}$=0.81	Moderately positive $\bar{x}$=1.07	Neutral $\bar{x}$=0.09	Moderately negative $\bar{x}$=-1.04	Moderately positive $\bar{x}$=1.33	Strongly positive $\bar{x}$=1.75	Strongly positive $\bar{x}$=2.00	Neutral $\bar{x}$=-0.12
Ecological Systems (Factor III)	Strongly positive $\bar{x}$=1.56	Moderately positive $\bar{x}$=1.14	Neutral $\bar{x}$=-0.33	Strongly positive $\bar{x}$=1.83	Neutral $\bar{x}$=0.17	Moderately Negative $\bar{x}$=-1.00	Strongly positive $\bar{x}$=2.00	Strongly positive $\bar{x}$=1.75

[1] The attitude and belief items from which the factors were created were scored from -2 (strongly disagree) to +2 (strongly agree).

wildlife populations and in restricting human activities in certain situations to minimize negative impacts on wildlife. Nor should it be surprising that the overwhelming majority approve of hunting and trapping, and feel that using wildlife gives society a vested interest in long-term wildlife conservation.

What may be more surprising to segments of the public who are not so close to the wildlife profession is that these same professionals who so strongly advocate the recreational use and harvest perspective of wildlife management overwhelmingly feel that not enough resources are being spent to conserve threatened and endangered wildlife and the natural systems these species depend upon for survival. Furthermore, while wildlife management occurs in the aggregate largely by affecting populations and therefore population welfare often takes priority to concerns about the welfare of individual animals, the vast majority of TWS respondents believe that it is important to find ways to minimize the pain and suffering of individual animals resulting from human uses.

Because the wildlife attitude and value topics that are most relevant or prominent to various human populations differ considerably (e.g., many HDRU studies have examined tolerance or acceptance of wildlife damage in considerable detail), and because different wildlife topics gain increased prominence over time, research instruments must necessarily be modified periodically. The items used in this attitude scale have had limited previous use. It is possible that more specific statements about wildlife uses or management activities and concerns could be developed which would provide greater discriminating power among various subgroups of the profession. Nevertheless, we feel that we can generalize from these results that most members of the profession share a set of common values that define an overall perspective of wildlife management.

Role of the Manager and the Public in Policy Decisions

Input to wildlife-related decisions occurs in many forms, and the actual decision making process takes many forms itself. The majority of respondents (73.1%) felt that the appropriate role of wildlife professionals vis-à-vis the public in policy decisions is for wildlife professionals to first obtain the views of the affected public and then proceed to do the planning and make the final decision. About one-fifth (19.1%) felt that wildlife professionals should only do the early planning and provide the alternatives from which the public can select. Only 5.2% felt that the planning and decision making should be left totally to wildlife professionals. At the other

extreme, only 2.4% felt that the public should control the entire planning and decision making process and use wildlife professionals as consultants and to implement their final plan.

Thus, it is clear that most respondents feel that wildlife management involves some degree of interplay between wildlife professionals and the public. Most members believe, however, that wildlife managers or administrators should be given the authority to make final wildlife-related decisions after public input has been obtained.

Educational Needs for Wildlife Professionals

The majority (72.6%) of members felt that some areas of additional expertise or skills are needed by recent graduates entering the profession, and that colleges and universities should give more attention to these at the undergraduate level. Two subject areas received far more write-in responses than any other: communication skills and public relations (by 32.7% and 18.9%, respectively, of those making suggestions). Other topics suggested by at least 5% of those with suggestions were public policy (including biopolitics, political science) (13.4%), human dimensions and people management skills (11.7%), statistics and computer use (11.5%), agency field experience (9.9%), habitat management skills for a variety of habitats (5.5%), and ecosystem management (5.0%).

About two-thirds (67.2%) of respondents felt that there were continuing education needs of wildlife professionals that should be the focus of professional development opportunities for TWS members. Three areas led the way with write-in responses by roughly one-fifth of those making suggestions: statistics and all uses of computers (22.2%), public relations (21.3%), and communication skills (21.1%). At a second level, human dimensions skills and public policy were listed by 11.5% and 11.3%, respectively. Three other topics were listed by more than 5% of those making suggestions: understanding new technology (6.8%), conservation biology (6.7%), negotiation skills (conflict resolution, consensus building) (6.4%), and ecosystem management (5.5%).

Analyzed another way, 51.3% of all suggestions for continuing education were broadly people-related. This includes communications, public relations, public policy, human dimensions, and courses in the social sciences and humanities. About 17.5% of all suggestions were for additional expertise that is primarily in the basic and applied biological and physical sciences. Another 15.0% were for research, problem solving, and decision making skills that did not imply

a particular discipline. Another 3.0% were for management and administrative skills such as planning and budgeting. The remaining comments were not easily placed in categories.

Future Directions for TWS

Questions were asked about membership preferences for the Society proceeding in several new directions:

Encourage Accreditation of College-Level Wildlife Education Programs

The majority (79.4%) felt that TWS should "encourage accreditation of college and university wildlife education programs." Only 8.4% responded negatively; 12.0% were unsure.

Consideration of Litigation on Issues

A slight majority (54.2%) of respondents felt that TWS should "consider litigation focusing on issues consistent with its positions on wildlife conservation and management issues. Similar proportions responded negatively (22.2%) and were unsure (23.6%). No further information was obtained on this topic. It is possible that questions related to litigation costs and how they would be financed contributed to the large "unsure" response as well as questions about the Society's status and image if it became an advocacy organization to this extent.

Encourage State Licensing of Wildlife Biologists

A plurality (37.6%) of respondents were against the Society encouraging state licensing of wildlife biologists. Almost one-third (32.8%) were unsure; only 29.6% responded positively.

Establish and Hold Members Accountable for Professional Standards

Two-thirds (67.0%) of respondents indicated that the wildlife profession needs to establish and hold members accountable for a set of professional standards. The other one-third broke down into 20.7% who were not sure and 12.3% who were opposed.

Other Input from Respondents

Unique Role TWS Should Play in Wildlife Conservation

In response to an open-ended question on what unique role TWS should play in wildlife conservation, compared to other organizations, 44 different responses were obtained even after recoding those which were quite similar. By far the 2 leading responses were to provide technical information to policy makers and others (29.2%) and to be an authority on scientific wildlife management (25.9%). Other responses given by at least 10 individuals were to set professional standards (6.4%), to provide an advocacy role for wildlife based on technical information (5.0%), to educate the public (4.6%), a national association to provide information and services to professionals (3.6%), professional development (2.3%), and specialize in habitat management (1.8%).

Other Ideas for Future Directions for TWS

An open-ended question asked respondents to indicate any other ideas (not previously covered in the questionnaire) about future directions for TWS. Almost half (47.2%) provided at least one suggestion. In total, 113 different suggestions were offered. These suggestions are reported regardless of whether or not they were covered previously in the questionnaire. The most frequent suggestions are shown in Table 9. As with all "write-in" suggestions, these must be interpreted carefully. Many of the suggestions center around actions that would make the Society more visible **outside** the profession (e.g., assuming a lobbying role, getting involved in public education).

Additional Services TWS Should Provide

Over one-fifth (22.9%) of respondents made 96 different suggestions as to additional services that TWS should provide. The leading suggestions are shown in Table 10. The 2 leading suggestions, offered by over 10% of those making suggestions, were for TWS to improve job referral services and to improve communications between members.

Reasons for Not Belonging to TWS

Finally, in an attempt to make the Society more relevant to those wildlife professionals who do not join, respondents were asked for their insights into why some professionals do not join TWS. Almost two-thirds (65.3%) of respondents offered 81 different reasons why some professionals do not belong. The leading reasons are shown in Table 11. In addition to the obvious factor of cost of dues and publications, which is difficult for young professionals entering most professions, the overall theme that can be generalized from most of the suggestions centers around making the Society and its publications as relevant as possible to most wildlife professionals. With the many specific professions encompassed within the Society, on-going study will be needed to bring about further improvement.

Table 9. Leading "other" suggestions about future directions for TWS.

Suggestion	% Responding Who Offered Suggestion	n
1. Increase the TWS lobbying role	16.3%	62
2. Get involved in public education	13.2%	50
3. Become less game oriented	8.7%	33
4. Become more ecosystem and less species oriented	6.6%	25
5. Collaborate with other societies more, including joint conferences	5.0%	19
6. Place more emphasis on management rather than research	3.7%	14
7. Place more emphasis on international-level topics	3.7%	14
8. Set standards for the profession	3.4%	13
9. Increase the exposure of TWS to the public	2.9%	11
10. Base policies on fact; avoid politics and emotion	2.7%	12
11. Place more emphasis on chapter and section level activities	2.4%	9
12. Become more active in undergraduate education	2.3%	9
13. Get a policy director[1]	2.1%	8
14. Continue with no changes	2.1%	8
15. Tie hiring and job advancement to certification	1.8%	7
16. Become more active in professional development	1.6%	6
17. Involve Canadians more	1.3%	5

[1]A policy director position was created and filled after the survey was implemented.

Table 10. Leading additional services TWS should provide.

Suggestion	% Responding Who Offered Suggestion	n
1. Improve job information services	11.9%	22
2. Improve communications between members (e.g., electronic bulletin boards, computer reference services)	13.2%	50
3. Provide training programs as continuing education	7.0%	13
4. Maintain computerized data bases (literature and data)	5.5%	10
5. Offer sponsorship and other nurturing of students	4.3%	8
6. Set up an international or interstate exchange program	2.7%	5
7. Issue legislative alerts and updates	2.7%	5
8. Develop a scholarship grant program for graduate students	2.2%	4
9. Develop a publication on wildlife law enforcement/forensics	2.2%	4
10. Develop a hotline where members can get information on key topics	2.2%	4
11. Market wildlife professionals through the media	1.6%	3
12. Make publications free to students	1.6%	3
13. Encourage pay parity for professionals, esp. state vs. federal	1.6%	3
14. Find ways to integrate research into management programs	1.6%	3
15. Provide more emphasis at the local level (e.g., community conservation projects	1.6%	3
16. Promote professionalism through certification and accreditation	1.6%	3
17. Educate the public about wildlife principles and management	1.6%	3

ERRATUM

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Table 10. Leading additional services TWS should provide. (Note corrections below:)

Suggestion	% Responding Who Offered Suggestion	n
2. Improve communications between members (e.g., electronic bulletin boards, computer reference services)	9.8%	18

Table 11. Leading perceived reasons why some wildlife professionals do not join TWS.

Perceived Reason	Percent Giving Reason	n
1. Dues/publications too expensive	30.6%	161
2. Uncertainty as to benefits of membership	12.4%	65
3. Lazy; unprofessional	11.4%	60
4. Publications and programs are not management oriented	10.7%	56
5. TWS is too research or academic oriented	8.9%	47
6 TWS is too game oriented	7.4%	39
7. TWS membership is not mandatory for job hiring or advancement	4.7%	25
8. People have other access to TWS publications (i.e., office, library)	4.7%	25
9. TWS does not deal with important issues	4.2%	22
10. People are more interested in local than national issues	3.8%	20
11. Not enough time	3.4%	18
12. Upper managers don't encourage others to attend TWS meetings	3.4%	18
13. Not enough is known about TWS; TWS is not visible	3.4%	18
14. Needs are met by other societies	3.2%	17
15. TWS is a "good ole boy" network	2.9%	15
16. TWS does not play an advocacy role	2.5%	13
17. TWS is elitist	2.3%	12
18. Insufficient public recognition of TWS	1.9%	10

SUMMARY

This study sought to learn more about the TWS membership, including the wildlife-related issues that are of highest priority and the types of wildlife paradigms held by the membership. In addition to providing this information, the study also provided a comprehensive evaluation of the wide array of services offered by TWS, and sought input into changes sought by the membership.

Membership Characteristics and Beliefs

Most TWS members are male, 30 to 49 years of age, and have been members for at least 10 years. Roughly half of the membership has been active in TWS activities of some type. Most members belong to at least one conservation organization, and just over half belong to other scientific and professional natural resource societies.

Among the many issues TWS might work with, members gave the highest priority to threatened and endangered communities/habitats and species management, wetlands riparian management, and biological diversity conservation. At the other end of the spectrum, animal rights and subsistence hunting topics were given relatively low priority ratings.

Results of the wildlife paradigm scale showed that 3 factors were important in describing TWS members: wildlife use, wildlife pain and suffering, and ecological systems. Cluster analysis results showed that TWS members are remarkably similar with respect to these factors. The vast majority of members had moderately to strongly positive utilitarian attitudes toward wildlife, were moderately concerned about the pain and suffering of individual animals, and had moderate to strong feelings that management and resource emphases should be placed at the system level on wildlife populations and habitats rather than on the well-being of individual animals.

Most respondents were also in agreement about the role of the wildlife manager in dealing with the public and arriving at public policy decisions: managers should obtain public input and factor that into the decision-making process, and then proceed to do the planning and make the final decision, according to 73.1% of respondents.

Evaluation of TWS Services and Programs

Generally high evaluative marks were given to the Society's 3 primary journal publications. Slightly over half would favor hiring a paid managing editor to handle the large volume of manuscripts submitted to these journals. Moderately important to very important rating were also given to all TWS books and special publications that we inquired about, and to the wide variety of meetings that TWS sponsors at various levels from state meetings to international symposia.

The one area investigated for which responses were relatively critical involved the TWS certification program. Only 37.6% of respondents felt that the program is serving a useful role in advancing the professional standing of wildlife biologists to the public. Only half of the respondents felt that the objectives of the certification program have been made clear to members. About half felt that the program should be revised to reflect the various specialty areas within the profession, especially wildlife manager, and possibly wildlife conservation officers, information and education specialists, and wildlife planners. Related to this, one possible new direction supported by a majority of respondents was for TWS to establish and hold members accountable to a set of professional standards. A majority of respondents also felt that TWS should encourage accreditation of college and university wildlife education programs.

The professional development program received generally high ratings from those who were familiar with it, but the majority of respondents were not familiar with the program. In terms of additional education needs, most respondents felt that those newly entering the profession were still in need of additional skills or expertise. Communications skills and public relations were indicated most frequently. These same topics along with additional computer skills were most frequently mentioned as continuing education needs for the profession generally.

Other possible initiatives favored by a majority of respondents included encouraging accreditation of college and university wildlife education programs, and establishing and holding members responsible to a set of professional standards.

This study has produced an insight into the characteristics, concerns, attitudes and beliefs of TWS members along with a comprehensive evaluation of TWS services and programs. We believe the results of the study will be useful in guiding TWS priorities for the next several years. Such study results become dated, however, as new information is produced and new issues surface. We suggest that the TWS officers be alert to this and consider repeating the study at a 5 to 10 year interval, as needed.

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Appendix A. Attitudes of TWS members toward wildlife management topics.

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
Attitudes toward Management					
a. It is ethical for humans to manage populations of wild animals	63.6	32.5	3.3	0.5	0.1
b. It is ethical for society to restrict human activities to minimize negative impacts on wildlife	66.1	29.9	2.7	1.0	0.2
Attitudes toward Consumptive Use of Wildlife					
c. Hunting is justified only when it is necessary to sustain human life	0.6	1.1	7.6	33.3	57.4
d. An important step in conserving wildlife species is to protect them from all forms of hunting	0.5	2.2	5.6	24.1	67.4
e. Using wildlife gives society a vested interest in the long-term conservation of wildlife	35.4	49.5	10.3	3.4	1.4
f. Hunting wild animals is morally right if it is done primarily to obtain food	11.8	29.1	33.1	17.0	9.0
g. Using wildlife for food is a natural part of human existence	36.3	44.8	14.2	3.4	1.4
h. Killing wild animals to sell their fur is morally wrong	5.6	9.8	18.6	30.7	35.3
i. Hunting is morally wrong because it violates the right of an individual animal to exist	0.6	0.7	8.0	29.2	61.5
j. It is wrong to regard wild animals as a renewable source of food	0.9	4.0	6.4	36.7	52.0
k. Most people who participate in trapping feel compassion for wildlife	10.4	30.5	40.9	13.8	4.4

	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
l. It is possible to view wildlife with reverence and still participate in hunting..	66.6	28.6	2.0	1.4	1.4
Attitudes toward Wildlife and Habitat Preservation					
m. Society should spend more resources in North America to conserve threatened and endangered wildlife.....	38.3	41.7	13.4	6.2	0.4
n. The people of North America are not doing enough to conserve the natural systems that wildlife depend on for survival.....	58.8	34.3	2.7	3.5	0.6
Attitudes toward Individual Animals					
o. The resources society expends to care for individual animals in nonthreatened populations would be better spent on conservation of habitat used by that population.....	50.1	37.9	10.0	1.6	0.4
p. Minimizing animal pain and suffering should be an important consideration in wildlife programs in North America...	14.9	41.8	25.4	12.5	5.5
q. The perpetuation of wildlife populations is more important than the welfare of individuals in nonthreatened populations.....	46.9	37.3	10.9	4.5	0.3
r. Anyone who uses wild animals in some way should be concerned about the pain and suffering of those animals.....	25.7	53.4	14.5	5.4	1.0